

US009543387B2

(12) United States Patent

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(54) SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 14/202,616

(22) Filed: Mar. 10, 2014

(65) Prior Publication Data

US 2015/0255578 A1 Sep. 10, 2015

(51) Int. Cl. H01L 29/08 H01L 29/66 H01L 29/78

(2006.01) (2006.01) (2006.01)

H01L 21/02 (2006.01) *H01L 29/165* (2006.01)

(52) U.S. Cl.

CPC H01L 29/0847 (2013.01); H01L 29/0843 (2013.01); H01L 29/0886 (2013.01); H01L 29/66636 (2013.01); H01L 29/66636 (2013.01); H01L 29/78 (2013.01); H01L 29/7848 (2013.01); H01L 21/02381 (2013.01);

(10) Patent No.: US 9,543,387 B2

(45) **Date of Patent:** Jan. 10, 2017

H01L 29/0869 (2013.01); H01L 29/165 (2013.01); H01L 29/665 (2013.01)

(58) Field of Classification Search

CPC H01L 29/0847; H01L 29/66628; H01L 29/7848; H01L 29/0886; H01L 29/78; H01L 29/66636; H01L 29/0843

See application file for complete search history.

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(57) ABSTRACT

A semiconductor device includes a gate structure located on a substrate and a raised source/drain region adjacent to the gate structure. The raised source/drain region includes: a first epitaxial-grown doped layer of the raised source/drain region in contact with the substrate; a second epitaxialgrown doped layer on the first epitaxial-grown doped layer and including a same dopant species as the first epitaxialgrown doped layer, wherein the second epitaxial-grown doped layer includes a higher dopant concentration than the first epitaxial-grown doped layer and interfacing the gate structure by using a predetermined distance; and a third epitaxial-grown doped layer on the second epitaxial-grown doped layer and including the same dopant species as the first epitaxial-grown doped layer, wherein the third epitaxial-grown doped layer includes a higher dopant concentration than the second epitaxial-grown doped layer.

20 Claims, 7 Drawing Sheets

